

## Description

### Liquid Product Applicator

#### Technical Field

The present invention relates to liquid product applicators generally and, more particularly, but not by way of limitation, to a novel liquid application brush that in one embodiment can permit both application and combing of applied liquid product with a single brush.

#### Background Art

The present invention is applicable to mascara and similar liquid products such as nail polish and eye liner.

Typically, an application brush has a round rod or stem that passes through a wiper having a circular opening in the center thereof that wipes off the product from the rod or stem of the applicator brush. The wiper also wipes off excess product from the brush. The brush itself is typically a spiral wound brush or it could also be a brush head, a flocked top, or other brush type. The rod is round so that it can rotate within the wiper when the top of the applicator is screwed onto or screwed off of the container of liquid product.

In the case of mascara, for example, the product is very viscous and tends to clump because of its high viscosity. In this case, one needs to use a separate mascara brush to comb out the clumped mascara clinging to the eyelashes after it is applied. This requires that two separate brushes be used – one to apply the mascara to the eyelashes and the other to brush out clumped mascara, so as to separate the eyelashes and prepare them for a more uniform distribution of the product. This also requires that the application brush be set aside or replaced in the container – requiring additional effort on the part of the person applying the liquid product.

In the case of some other products, there is no way to satisfactorily regulate the amount of product that is removed from the container.

Accordingly, it is a principal object of the present invention to provide a liquid applicator brush that can be used both to apply product and to comb the product once it is applied.

It is a further object of the invention to provide such a liquid applicator brush that is easily used by a consumer and that requires no additional effort on the part of the consumer.

It is an additional object of the invention to provide such a liquid applicator brush that can be economically and easily fabricated using conventional techniques.

It is another object of the invention to provide controlled amounts of product in specific areas on the brush for better delivery of product and enhanced utility.

Other objects of the present invention, as well as particular features, elements, and advantages thereof, will be elucidated in, or be apparent from, the following description and the accompanying drawing figures.

#### Disclosure of Invention

The present invention achieves the above object, among others, by providing in a preferred embodiment, an apparatus, comprising: a liquid product applicator; and means to wipe liquid product from only a portion of said liquid product applicator, while leaving a greater amount of liquid product on other portions of said liquid product applicator. A method of using said liquid product applicator is also provided.

#### Brief Description of Drawings

Understanding of the present invention and the various aspects thereof will be facilitated by reference to the accompanying drawing figures, provided for purposes of illustration only and not intended to define the scope of the invention, on which:

Figure 1a is a front elevational view, in cross-section, of a liquid product applicator spiral wound brush or product carrier, constructed according to one

embodiment of the present invention, and inserted in a liquid product container.

Figure 1b is a side elevation view, in cross-section, of the liquid product spiral wound applicator brush of Figure 1a inserted in a liquid product container.

Figure 2 is a top plan view of a wiper according to the embodiment of Figures 1a 1b.

Figure 3a is top plan view of a spiral wound applicator brush constructed according to one embodiment of the present invention.

Figure 3b is a top plan view of a spiral wound applicator brush constructed according to a further embodiment of the present invention.

Figure 3c is a top plan view of a spiral wound applicator brush constructed according to an additional embodiment of the present invention.

Figure 3d is a top plan view of a spiral wound applicator brush constructed according to another embodiment of the present invention.

Figure 4a is a fragmentary, side elevational view, in cross-section, showing the independent rotation of the brush with respect to the closure and fitment.

Figure 4b is a side elevational view, in cross-section, of another embodiment of the present invention, showing the independent rotation of an integral brush and fitment with respect to the closure.

Figure 5 is a bottom plan view of an embodiment of the present invention in which doctor blades depend from the orifice of the wiper.

Figure 6 is a fragmentary end elevational view of the embodiment of Figure 5.

Figure 7 is a fragmentary side elevational view of the embodiment of Figure 5.

Figures 8a-8d are side elevational views of various shaped doctor blades depending from the orifice in the wiper of the embodiment of Figure 5.

Figures 8e and 8f are end elevational views of various shaped doctor blades depending from the orifice in the wiper of the embodiment of Figure 5.

Figures 9a-9f are bottom plan views of various shaped doctor blades depending from the orifice in the wiper of the embodiment of Figure 5.

Figure 10 is a variation of the embodiment of Figure 5.

Figures 11a-14b show various types of product carriers that may be used with the embodiments of the present invention.

#### Best Mode for Carrying Out the Invention

Reference should now be made to the drawing figures on which similar or identical elements are given consistent identifying numerals throughout the various figures thereof, and on which parenthetical references to figure numbers, when used, direct the reader to the view(s) on which the element(s) being described is (are) best seen, although the element(s) may be seen on other figures also.

Figures 1a and 1b illustrate a liquid application device, constructed according to the present invention, and generally indicated by the reference numeral 10. Device 10 includes a liquid product container 20 having an externally threaded neck portion, a closure or screw cap 22 shown apart from the container but which can be screwed onto the container, and an applicator comprising a shaft or stem 24 having a brush structure 26 disposed surrounding its flattened distal portion 28 extending into the container and its proximal portion 30 extending into and contacting the interior of cap 22 and supported in the top by insert member 32. A flange 40 formed around proximal portion 30 of shaft or stem 24 engaging the top of insert member 32, fixedly disposed in cap 22, and the engagement of the proximal end of the shaft or stem with the inner surface of the cap secures the shaft or stem in place. Shaft or stem 24 passes through a complementarily shaped orifice 50 formed in the center of a wiper 52 frictionally and fixedly disposed in a conventional manner in the top opening of container 20. Brush structure 26 is typically nylon and spiral wound, although it can be of other materials and other construction, as noted above.

It can be seen from inspection of Figures 1a and 1b, that distal portion 28 of shaft or stem 24 is flattened in profile, that is, it is non-symmetrical with respect to the major axis of the distal portion. Also, it will be understood that, when cap 22 is screwed onto liquid product container 20, that shaft or stem 24

and, consequently, brush 26 will remain fixed with respect to the liquid product container, by virtue of the fact that distal portion 28 of shaft or stem 24 engages the walls of the orifice 50 in wiper 52, the latter being frictionally held rotatably immobile with respect to the liquid product container 20. The shaft or stem 24 of the applicator is thus keyed to the neck of the container against rotation or turning when the cap is fully seated on the neck, as well as when the cap is being threaded partially onto the neck.

Figure 2 illustrates wiper 52 with orifice 50 defined in the center thereof. Orifice 50 in this case is rectangular and cooperates with distal portion 28 of shaft or stem 24 which is likewise rectangular in horizontal cross-section. The rectangle shape shown for orifice 50 is the most rudimentary geometry and orifice 50 can assume other shapes, such as a triangle or an oval, provided that the orifice is non-circular and non-symmetrical with respect to the major axis of distal portion 28 of shaft or stem 24 and is complementarily shaped with respect thereto. As is evident from Figures 1a, 1b, and 2, in order to maintain the cooperating registration or keying of shaft or stem 24 and wiper orifice 50, when cap 22 is turned during opening and closing of container 20, the interaction between the cap and shaft or stem 24 is arranged to be free-wheeling, with a minimum of friction, so that brush structure 26 does not rotate when the consumer is applying mascara onto the consumer's eyelashes.

Referring now to Figure 3a, there is illustrated brush structure 26 rounded in shape and orifice 50. In this case, orifice 50 is shown in rectangular configuration, although, as noted above, orifice 50 could have other configurations, with appropriate changes in the brush structure. Here, brush structure 26 has areas of high densities of bristles 60 and 62 and areas of low densities of bristles 64 and 66. Thus, after bristle structure 26 passes through orifice 50, areas 60 and 62 will be heavily laden with mascara, for example, while areas 64 and 66 will be wiped more cleanly by the orifice. The user, then, can apply the mascara using mascara laden areas 60 and 62 and then rotate brush structure 26 to use relatively clean areas 64 and 66 to comb out the mascara.

Figure 3b shows bristle structure 26 being rounded and having uniform

density of bristles. However, after passing through orifice 50, areas 60 and 62 will be more laden with mascara, while areas 64 and 66 will have less mascara and the latter can be used for combing out the mascara.

Figure 3c is similar to Figure 3a, except that bristle structure 26 has an oval shape, with the long axis of the oval being oriented parallel to the long axis of orifice 50.

Figure 3d is similar to Figure 3a, except that bristle structure 26 has a rectangular shape, with the long axis of the bristle structure being oriented parallel to the long axis of orifice 50.

Figure 4a illustrates, with reference to arrows "A" and "B", the independent rotation of shaft or stem 24 with respect to cap 22, so that the shaft or stem remains in a fixed position with respect to wiper 52 even when the cap is screwed onto or unscrewed off of liquid container 20 (Figures 1a and 1b).

Figure 4b illustrates another embodiment of the present invention, generally indicated by the reference numeral 10'. Elements similar or identical in function to those described above are given primed reference numerals. Here, shaft or stem 24' is flattened throughout and integral with a fitment 70 at the proximal end of the shaft or stem, the fitment being rotatably captured in cap 22'. Thus, again by virtue of non-symmetrical shaft or stem 24' passing through a complementarily shaped orifice 50' in wiper 52', bristle structure 26' remains fixed with respect to liquid product container 20' even as cap 22' is rotated as it is screwed onto or unscrewed off of the liquid product container.

Figure 5 illustrates yet a further embodiment of the present invention. In this embodiment, wiper 100 has a body portion 110 with an orifice 120 defined generally in the center of the body portion of the lower end thereof. In contradistinction to conventional wipers, orifice 120 is not symmetrical with the major axis of wiper 100, as is shown in Figures 3a-3d, but is presented as a racetrack. As seen on Figure 5, two oppositely disposed, flexible doctor blades 130 and 132 depend from the edges of orifice 120 and are oriented such that the distal ends thereof approach each other.

Figure 6 illustrates a shaft or stem 140 and a brush 150 depending from

the shaft or stem and extending horizontally from a spiral wire 160. Brush 150 is inserted through wiper 100 and is illustrated in cross-sectional view across the narrowest aperture of doctor blades 130 and 132. As described above, as shaft or stem 140 is pulled through wiper 100, liquid product will be wiper therefrom. The opening between doctor blades 130 and 132 is equal to or nearly equal to the diameter of spiral wire 160, so that the liquid product will be displaced from the spiral wire 160 and from any bristles that are in proximity to the spiral wire.

This arrangement can also be used to control the amount of liquid product removed from a container by a shaft or stem that does not include a bristle structure as part thereof.

Figure 7 illustrates wiper 100, from the side, and presents the widest cross-section of doctor blades 130 and 132, rotated ninety degrees from Figure 6. It will be noted that shaft or stem 140 is asymmetrical about its own axis, although it is complementary to orifice 120 (Figure 6) so that the liquid product will be completely wiped from the shaft or stem.

It will be understood that brush 150 may also be asymmetrical, permitting it to be oriented to wiper 100. Besides having wiper 100 clean the product to some degree from the bristles of brush 150, doctor blades 130 and 132 selectively clean away liquid product from spiral wire 160 and affect distribution of liquid product on the periphery of the bristles of the brush. It has been found that this arrangement has a tendency to move the liquid product from close to spiral wire 160 so that the liquid product will be displaced from the spiral wire and from bristles that are in proximity to the spiral wire, distributing the liquid product towards the outer ends of the bristles.

Figures 8a-8f are side and end elevational views illustrating various shaped doctor blades, presented as examples only and not to be construed as limiting any other arrangements.

Figures 9a-9f are bottom plan views illustrating various shaped doctor blades, presented as examples only and not to be construed as limiting any other arrangements.

Figure 10 illustrates still another solution to maintaining registration or

keying between shaft or stem 140 and orifice 120 of wiper 100. In this arrangement, a portion 170 of shaft or stem 140 is cylindrical. Accordingly, brush 150 is free to rotate independently from wiper 100 in the positions shown on Figure 10, but reestablishes proper orientation before the brush is pulled through orifice 120 of wiper 100.

Figures 11a-14b illustrate that the unique wiper 100 is not limited to encouraging a control lay-down of the liquid product on a spiral wound brush, but may be applied similarly and effectively to other applicators such as a flocked doe's foot, a foam mitt, a narrow tipped liner brush, or a wide tipped liner brush.

In the embodiments of the present invention described above, it will be recognized that individual elements and/or features thereof are not necessarily limited to a particular embodiment but, where applicable, are interchangeable and can be used in any selected embodiment even though such may not be specifically shown.

Spatially orienting terms such as "above", "below", "upper", "lower", "inner", "outer", "inwardly", "outwardly", "vertical", "horizontal", and the like, when used herein, refer to the positions of the respective elements shown on the accompanying drawing figures and the present invention is not necessarily limited to such positions.

It will thus be seen that the objects set forth above, among those elucidated in, or made apparent from, the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown on the accompanying drawing figures shall be interpreted as illustrative only and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.